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U. S. Department of Agriculture  
and State Agricultural Colleges  
Cooperating

Extension Service, Office of  
Cooperative Extension Work,  
Washington, D. C.

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SUMMARIZED REPORT OF THE EXTENSION CONFERENCE ON THE CONTROL OF THE  
EUROPEAN CORN BORER, TOLEDO, OHIO, JULY 20 and 21, 1927

The extension services of the several States recognize the serious situation caused by the spread of the European corn borer in the Corn Belt and will direct the full force of the organization into an educational campaign to bring about effective control. Although the situation is serious, it should not be alarming. It is believed that farm practices now will be developed which will enable the farmer of the Corn Belt to continue the production of corn. It is recognized that farm practices must be changed to meet the condition brought about by the infestation. Many of these practices will result in more efficient farm operation. It is further recognized that changes in cropping systems and types of livestock may be necessary in heavily infested areas. Such changes may result in increased farm income and improved farm practice.

The conference recognizes that the success of the intensive spring campaign to control the corn borer has been due principally to the cooperation accorded by the farmers in the areas concerned.

Agricultural Engineering

Research

The clean-up campaign has uncovered a host of problems and possibilities for service by the agricultural engineers. The advice of the agricultural engineer to be of value must be concrete and apply to specific and varied cases. Even with a great amount of work done it does not seem possible to advise intelligently as to what equipment may be best used to dispose of standing stalks where plowing is not practiced. Sled cutters and other low-cutting devices applicable, where the corn binder can not be used, should be worked out.

A low-cost temporary silo, which would serve as a means of economically handling the corn crop, and which would in many sections carry the farmer through the transition period, is believed to be sound and should have cooperative study by agricultural engineers. Other methods making the best utilization of stalks in the plan of farm operation should be studied. In fact, the lack of specific and dependable data and the inadequacy of much equipment for the job at present make it more and more evident that rapid progress should be based on research and sound reasoning rather than the slow process of experience. A correlated and comprehensive research program would solve the ever elusive answers to problems which appear so near and yet are so far away. Briefness of time to set these problems forth has in no way lessened their importance.

For the time being, the success of corn-borer control depends very largely upon how rapidly the agricultural engineer makes it easy and economical for the farmer to control the pest by mechanical processes.

The agricultural engineer's problems are much more intricate and difficult than is at first supposed by persons who have not been actively engaged in machinery development work. Not only are the methods of handling





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the corn crop complex, but also these methods involve some 24 types of machines now existing, none of which can be considered as perfected.

Although it is true that never before in the history of insect control has as much been accomplished in so short a time, nevertheless mechanical control is in its infancy in comparison to the amount of research, investigation, study, and development work yet to be done if we arise to the exigencies of the moment speedily enough and in a sufficiently comprehensive way to be of most service to American agriculture. Therefore, we recommend that a broad program of agricultural engineering research be organized and wisely supported in order that extension work may be supplied continually with complete and accurate information necessary for planning and executing successful educational programs.

Because of the closely linked condition between control requirements and engineering practices, the agricultural engineering group had difficulty in making recommendations that might be applicable to future control conditions. The following recommendations are based on the supposition that there will be in effect control regulations for the following year similar to the spring of 1927.

#### Recommendations

(1) Plowing contests will be recommended this fall in communities where demonstrations were held this spring. The contest will be conducted not alone for quality of work, but for speed and accuracy with which the contestant can make adjustments. It is hoped that this type of contest will stimulate pride on the part of the operator for better plowing which will in turn help control the borer and make better farmers in the future.

(2) Plowing demonstrations where requested are recommended in communities where there is a need, and where they have not previously been held.

(3) Low-cutting demonstrations are recommended this fall in communities where applicable for the purpose of broadening the low-cutting idea since low cutting eliminates other costly operations.

Your committees on dairymen and animal husbandry finding some problems too closely related to justify separate reports, have met in joint session and prepared a combined report on the questions relative to corn-borer control as they affect livestock. The problems are approached from the standpoint of outlining the chief factors to be determined by investigation and of making recommendations for immediate practice to be followed in the light of our present knowledge.

It developed early in the conference that additional information pertaining to effective destruction of the corn borer and the relative costs are necessary before intelligent recommendations for permanent changes in livestock practice can be made.





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We suggest that investigations be undertaken to determine the effectiveness in corn-borer destruction of the following operations:

- (1) Cutting corn, shredding fodder, and beating corn stubble.
- (2) Gathering standing corn with corn picker having special attachment to shred stalks.
- (3) Feeding whole corn fodder or shock corn to livestock in small lots, or stalks, and disposal of cobs from ear corn fed in feed lots.
- (4) Baking and burning cornstalks.
- (5) Plowing down cornstalks.

In addition to the effectiveness of the above mentioned practices, figures on relative cost must be obtained in order to enable livestock men to select the practice to be followed under any specific condition.

It is believed that with definite knowledge as to cost of different effective methods of corn-borer destruction and our present knowledge of the relative values of feeds, specific recommendations for any necessary changes in livestock practice can be made.

For the present we suggest the following recommendations for extension workers:

- (1) Encourage the use of silos on all farms having 10 or more cows or their equivalent. Consideration should be given to refilling silos with shock corn.
- (2) Fodder should be shredded where the livestock on the farm can profitably utilize the shredded fodder either for feed or bedding.
- (3) One acre of legume hay should be produced for each mature beef or dairy cow kept.

#### Farm Management

The farm-management extension program should be designed to give to the farmers in each of the many type of farming areas infested with the corn borer continuously up-to-date information as to the adjustments in both farm organization and practice that will enable them to make the best returns.

Research is needed to develop information on such points as: (1) Additional costs involved in putting into effect various control measures, (2) adjustments in production and harvesting practices to control the corn borer that are the most economical on farms of different types and sizes, and (3) changes in cropping systems and livestock production and their effect on farm incomes.





This information supplemented by information on the immediate and long-time market outlook for various crops and livestock, and facts obtained from entomologists, agricultural engineers, agronomists and others can be used in outlining systems of farming and of farm operation which will include corn-borer control methods, and at the same time maintain or increase incomes.

Because of the diversity of conditions in different areas, it will be necessary to assemble and analyze information of this kind for each type of farming area affected by the corn borer. It is evident that the problem is much more urgent in areas where a large portion of the crop acreage is devoted to corn than where corn is relatively unimportant.

Special research studies to assemble the facts and information not now available, in so far as they can be determined at this time, are now under way in each of the eight major type of farming areas in the infested portion of northern Ohio. It is expected that the results of these studies which supplement material already available, will make possible the formulation of a tentative farm-management extension program for each area in Ohio. It is the thought of this group that similar studies should be inaugurated immediately in infested areas in Michigan and Indiana where corn is an important crop in the systems of farming.

It is recognized that the problem of farm-management adjustments should be considered from a long-time as well as an immediate viewpoint, inasmuch as the most economical procedure on farms for one year is not always the most economical or profitable over a period of years.

The extension procedure will include meetings, tours, news articles, exhibits, and the like. Farm-business adjustment clubs may be organized where farmers study their business and make changes in the light of the best available facts, record the changes made and the effect of such changes on farm income. Farm-business planning or budgeting meetings might be held where farmers come together early in the year for a study of their plans in advance of farming operations. All farmers should be encouraged to keep accounts, study their business, and compare their results with the results obtained by those meeting the situation most successfully. This same material can be used in helping the county agent project his full program in line with the facts that will maintain or increase farm incomes. The effectiveness of farm-management extension work will depend largely upon the information made available through research.

In all this work close cooperation with agronomists, entomologists, agricultural engineers, livestock specialists, and others is essential. In some cases meetings should be planned and conducted jointly with one or more of the above mentioned divisions.

#### Agronomy

The committee feels that at present there is nothing to warrant recommending changes from the ordinary profitable practices in the actual production of corn.





Farmers should continue using those varieties found to be most profitable under normal conditions. They should continue planting at the rate and date found optimum for the locality. Continue following the locally recommended fertilizer practices.

The committee feels particularly the need for additional information that can be had only as a result of further research.

#### Entomology

(1) We favor a permanent program of instruction through demonstrations, tours, community discussions, exhibits, publications, and the like, advocating practical control measures that can be applied the year around. The instruction should be based on facts determined through research and be administered through the county extension agents.

(2) The extension program of instruction should be offered to farmers' institutes, or similar meetings, and include regular community meetings, and at demonstrations throughout the year.

The discussion of any special State or Federal regulations and the compulsory clean-up program should be limited, in so far as possible, to special meetings called for that purpose.

(3) Corn-cutting demonstrations if requested are recommended if the resulting stubble will pass inspection. We favor the use of Federal or State owned tractors and binders in these demonstrations to be conducted in cooperation with the county extension agent.

(4) Plowing demonstrations are recommended only in communities where desired. General information on mechanical equipment should be given through publications, plowing contests, and so forth.

(5) County tours in September to heavily infested fields located in northern Ohio or Ontario are recommended.

(6) We recommend that the offices of extension and regulatory work in the counties be separate.

#### Informational and News Service

(1) The corn-borer informational service of the State agricultural colleges and the United States Department of Agriculture feels strongly that the informational service constitutes a supporting organization, assisting in carrying out the program of the various agencies engaged in corn-borer control. In other words, it stands ready to make accessible to the people all effective information on the corn borer and its control just as fast as facts are made available through research and experience.





(2) It is recommended that the informational service be predominantly of an educational nature, supporting State and Federal agencies on those phases of regulatory work which are closely associated and interlocked with educational activities.

It should be expected to handle only those parts of informational activities which are in line with an educational program and should not be expected to disseminate news on emergency regulatory activities which would tend to confuse in the public mind the educational and the regulatory functions of corn-borer control. At times, of course, the informational service through the established channels of reaching the people may help to clarify the reasons for the regulatory activities.

(3) In supporting a permanent program of corn-borer control, it is urged that the informational service be continued throughout the year, rather than concentrating its efforts on ephemeral "peak" campaigns.

(4) The extension editors of the States cooperating in carrying on the campaign commend particularly the effectiveness of the illustrated news service issued by the United States Department of Agriculture and recommend that funds be set aside for its continuance on a similar basis of cooperation with the State extension editors.

#### Extension Directors

The extension services of the States now infested with the European corn borer have during the year 1927 initiated a comprehensive educational campaign for the control of the borer. It is essential that this educational work be continued in order that the full benefits of the work of the current year be carried to the farmers.

It is strongly urged that the United States Department of Agriculture allot to the States funds to continue the work as follows:

#### 1927 - 1928

4	State leaders.....	\$20,000
5	Editors.....	20,000
3	Farm management specialists.....	15,000
4	Agricultural engineers.....	16,000
2	Entomologists.....	8,000
72	Assistant county agents.....	108,000
		<u>\$187,000</u>

#### 1928 - 1929

4	State leaders.....	\$20,000
5	Editors.....	20,000
3	Farm management specialists.....	15,000
4	Agricultural engineers.....	16,000
2	Entomologists.....	8,000
82	Assistant county agents.....	123,000
		<u>\$202,000</u>





It is requested that the allotment from the United States Department of Agriculture be used to supplement the large expenditure that the States are now making to effectively control the European corn borer.

Committee on Corn-Borer Research

The committee feels particularly the need for additional information on which to base recommendations if, when, and as, infestation by the European corn borer increased in distribution and intensity. This information can be had only as a result of research.

Some of the important lines of research cover (1) agronomic studies on resistant or tolerant corn varieties, on the reduction of borer injury by means of late planting, or the use of fertilizers, and on the substitution of other crops than corn; (2) chemical studies on poisonous or repellent substances for use on the corn plant, determination of attractant substances to draw the borer moths to traps, and methods of industrial utilizations of cornstalks and cobs; (3) climatic and ecologic studies to determine the factors influencing borer distribution and prevalence, and thus permit forecasts of its probable destructiveness in the corn growing areas not yet infested; (4) entomologic studies on the habits and parasites of the borer, the factors influencing its life history, and its spread, and methods for its control; (5) animal and dairy husbandmen problems concerned with the relative costs of handling the cornstalks in the various ways in borer control so that the most economical methods of stalk utilization may be determined under different types of livestock farming; (6) engineering studies on methods and machinery for harvesting corn, shredding fodder, gathering or destroying stalks and other refuse, and handling any substitute crops employed; and (7) to determine the practicability of the application of all research results through studies of relative costs of different farm practices now in use in meeting corn-borer control measures, a study of costs of the practices now necessary or which may become necessary, and the changes in farm organization which will give the farmer the most profitable possible system where the corn borer is present.

The committee, therefore, recommends that this conference go on record as urging the fullest support for corn-borer research programs of the individual States, and the unified program of the corn-borer committee of the United States Department of Agriculture, and that this action be brought to the attention of the proper budget and legislative officials of the States and the Federal Government.

